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The power of play in microfinance: Examining the effect of gamification on customer relationship management performance

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ABSTRACT

This study delves into the impact of gamification usage on the customer relationship management performance of microfinance platforms in China. Specifically, we systematically investigate the positive and negative perceptions influencing gamification adoption, which in turn affect satisfaction, customer engagement, and retention. Our results show that perceived benefit positively influences gamification usage intention, whereas perceived sacrifice exerts a negative impact. Furthermore, gamification usage intention correlates positively with satisfaction, customer engagement, and retention. Finally, the study highlights the positive relationships between satisfaction and customer engagement, as well as between customer engagement and retention. However, no significant relationship is observed between customer satisfaction and customer retention. These insights offer essential implications for enhancing user experiences and fostering customer loyalty.

1. Introduction

With the rapid advancement of mobile technologies, the financial industry in China is undergoing a revolutionary transformation (Feng and Jantarakolica, 2023). Online microfinance platforms like Alipay, WeChat Pay, and JD Finance have gained prominence by offering a wide range of financial services, including mobile payments, money transfers, financial management, and insurance. These platforms have become the preferred choice for numerous individuals to meet their financial needs due to their flexibility and convenience in accessing financial services (Zhang and Kim, 2020). For example, as one of China's leading microfinance platforms, Alipay has exceeded 1 billion users and caters to the majority of smartphone users and businesses in China (Zhang, 2023).

As a strategy to enhance user engagement and improve experiences, gamification is being actively employed by microfinance platforms to establish stronger customer relationships (Yu and Huang, 2022). By integrating game elements such as points, rewards, and badges into their financial services, these platforms aim to create a more interactive and gratifying user experience (Yathiraju and Dash, 2023). For instance, Alipay allows users to receive red packets before making mobile payments, which increases excitement and encourages more transactions. Another example is the points and rewards system provided by Alipay, enabling users to accumulate points with each mobile payment for later redemption of prizes or use within the platform. This system provides ongoing incentives and fosters user participation, as individuals strive to earn more points. Fig 1 presents various gaming elements within microfinance platforms.

Given the widespread integration of gamification, it is imperative to scrutinize its impact on microfinance platforms. While prior research on gamification has provided substantial evidence of its effects in various domains, such as education (Oliveira et al., 2022; Toda et al., 2019), health (Al-Rayes et al., 2022; Esmaeilzadeh, 2021), marketing (Milanesi et al., 2022; Whittaker et al., 2021), and finance (Wu et al., 2023; Yu and Huang, 2022), there has been limited investigation into how gamification influences the microfinance sector, especially from a customer relationship management (CRM) perspective.

CRM is essential for microfinance platforms to enhance user experiences and build lasting customer relationships. Effective CRM performance can directly contribute to business performance by influencing satisfaction, customer engagement, and retention (Wang et al., 2022). Therefore, understanding how microfinance institutions can achieve superior CRM performance through various management strategies is crucial. By examining how gamification affects CRM performance indicators (e.g. satisfaction, customer engagement, retention), we can

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unveil valuable insights into the strategies that microfinance platforms can employ to improve their user experiences and cultivate customer loyalty (Dewnarain et al., 2019; Setiawati et al., 2019). Hence, this paper seeks to shed light on the dynamic relationship between the incorporation of gaming elements and the effectiveness of CRM at the level of customer behavior.

While existing studies commonly analyze the influence of gamification on user behavior, there is a tendency to overlook the exploration of the factors preceding the adoption of gamification (Bitrián et al., 2021; Wu et al., 2023; Zhang et al., 2023). Moreover, the scant studies addressing the antecedents of gamification often fail to consider the ramifications of negative factors (Dhahak and Huseynov, 2020; Tamrin et al., 2022; Yu and Huang, 2022). Hence, a comprehensive analysis of the potential benefits and drawbacks of gamification usage is also required to create a more attractive and user-friendly environment for the customers of microfinance platforms.

In summary, this study provides a comprehensive analysis of gamification within microfinance platforms by integrating the valence framework with the CRM performance indicators. It extends beyond an empirical exploration of the effects of gamification on CRM performance, also delving into both positive and negative factors influencing the adoption of gamification. This study contributes significantly to the understanding of how gamification impacts CRM performance and highlights the need for further research into the complex factors influencing consumer behavior. Our findings offer practical insights for microfinance and other financial institutions seeking to improve user experience and enhance customer relationships. Additionally, these findings pave the way for more nuanced and effective strategies in the pursuit of customer loyalty across various industries.

Fig 1. Interactive games for microfinance platforms.

2. Theoretical background

2.1. Gamification

Gamification involves incorporating game design elements, such as points, rewards, and badges, into non-game contexts (Duggan and Shoup, 2013). It leverages users' intrinsic motivations, including competition, fulfillment, and social interaction, to enhance engagement and overall experience (Stott and Neustaedter, 2013). Academic research on gamification is diverse, ranging from the focus on game elements and designs to the evaluation of their impacts on user experience. Researchers also explore the factors influencing user intentions to engage with gamification. For example, Guo et al. (2022) explored the game mechanics preferred by elderly adults and found that the most appealing game elements for them were winning status and rewards. Additionally, Xi and Hamari (2020) , Qian et al. (2022), and Yadav and Dangi (2023) all explored the impact of gamification on brand engagement and loyalty in the context of e-commerce. Foroughi et al. (2023) demonstrated that perceived usefulness, attitude, and habit significantly influence continuance intention to use gamification applications.

Gamification has made significant inroads into diverse domains, including education (Sailer and Homner, 2020; Sanchez et al., 2020), healthcare (Tran et al., 2022; Yin et al., 2022), transportation (Wang et al., 2022; Yen et al., 2023), tourism (Frías-Jamilena et al., 2022; Wei et al., 2023), and finance (Dzandu et al., 2022; Zhang et al., 2023). In particular, by combining technology, psychology, and finance, gamification has become a powerful tool for financial institutions to retain customers and outperform the competition. Hence, scholars have dedicated to examining how gamification affects customer experience and behavior toward financial services (Malik and Singh, 2022; Rodrigues et al., 2016; Wong et al., 2022; Zhang et al., 2023) (see Table 1). For instance, Rodrigues et al. (2016) investigated the adoption of gamified e-banking applications by bank customers and found that customers' usage intention to e-banking was affected by perceived ease of use and enjoyment. According to Malik and Singh (2022), customers' intention to adopt mobile payments is significantly mediated by gamified features. Besides, Yang et al. (2023) further explored how motivations, expectations, and conditions influenced consumers' intention to adopt a gamified mobile wallet, emphasizing the role of effort expectancy, facilitating conditions, and perceived value.

Online microfinance platforms play a pivotal role in China's financial industry by facilitating financial inclusion and expanding access to credit for individuals and small businesses. These platforms drive digital financial innovation and enhance the efficiency and accessibility of financial services. While gamification is widely utilized by Chinese microfinance platforms, research in this area remains limited. Moreover, existing research primarily analyzes the impact of gamification on user behavior while overlooking the exploration of the antecedents of gamification usage. Through an examination of 447 Alipay users, for example, Zhang et al. (2023) discovered that gamified features positively influence user retention through enhanced engagement. Wu et al. (2023) found that gamification significantly contributes to extended mobile payment usage based on data from 323 Alipay Ant Forest users surveyed via online questionnaires.

Nevertheless, there is a scarcity of evidence regarding the influence of gamification on CRM performance. Moreover, existing research predominantly emphasizes the positive aspects while overlooking potential negative factors (Dhahak and Huseynov, 2020; Tamrin et al., 2022; Yu and Huang, 2022). Therefore, our paper seeks to integrate the valence framework and the CRM performance indicators to deliver a comprehensive analysis of both positive and negative aspects influencing the use of gamification and its overall impacts.

2.2. Valence framework

The valence framework, initially introduced by Peter and Tarpey (1975) to study consumer behavior, underscores the importance of striking a balance between perceived benefit and perceived risk in decision-making processes. This framework addresses the limitations of theories that concentrate on only one aspect by simultaneously considering both favorable and unfavorable aspects (Lin et al., 2014). To date, the valence framework has been effectively applied in prior studies to elucidate behavioral intentions across various domains, such as health, retailing, transportation, and finance (Lu et al., 2011; Song et al., 2021; Xiao and Li, 2019; Xiao et al., 2021).

Notably, both Ryu (2018) and Abdul-Rahim et al. (2022) have illuminated the complex interplay of perceived benefit and risk shaping fintech adoption. Additionally, Ozturk et al. (2017) highlighted the significant impact of positive and negative variables on the utilization of mobile payment systems. In contrast, Chin et al. (2020) proposed that trust and perceived benefit play a considerably more influential role in shaping the adoption of mobile payment systems compared to perceived risk.

Table 1
Measurement items.

Constructs	Indicators	Resource
Satisfaction	S1: I am satisfied with the microfinance service provided by this platform. S2: The microfinance service provided by this platform has performed well. S3: The microfinance service provided by this platform met my expectations.	Chung et al. (2020)
Customer engagement	CE1: I actively participate in the microfinance activities of this platform. CE2: I am a contributing member of the microfinance activities of this platform. CE3: I frequently interact when I participate in the microfinance activities of this platform.	Busalim et al. (2021)
Customer retention	CR1: I recommend the microfinance services of this platform to others. CR2: I encourage friends and relatives to use the microfinance services of this platform. CR3: I speak positively about this platform to others.	Almohaimmeed (2019), Leninkumar (2017)
Perceived sacrifice	PS1: Playing games on this platform requires additional effort. PS2: Playing games on this platform is time-consuming. PS3: I am concerned about the loss of privacy when playing games on this platform. PS4: I get annoyed when I have to play games on this platform for rewards.	Ameen et al. (2021)
Perceived benefit	PB1: Playing games on this platform provides me with pleasure. PB2: Profit can be earned from game item trading. PB3: Playing games on this platform is beneficial in terms of finances education, entertainment, and social interaction. PB4: I am influenced by others to play games on this platform.	Yu and Huang (2022), Yoon et al. (2013)
Gamification usage intention	GUI1: I will keep playing games on this platform. GUI2: I will use the gamification for microfinance in the next few months. GUI3: I intend to continue to use gamification for microfinance in the future.	Wei and Zhang (2008), Meyer-Waarden et al. (2020)

Perceived benefit involves users' perceptions of technology advantages (Kuan and Chau, 2001), encompassing aspects like entertainment, economy, utility, and social factors in the case of gamification (Soni et al., 2019). Past studies have shown that perceived benefit is positively related to behavioral intentions (Kanwal et al., 2020; Li et al., 2016; Zhang et al., 2022). According to De Kerviler et al. (2016), perceived benefit (including convenience and enjoyment) positively predicts mobile payment usage.

Perceived risk, conversely, reflects concerns about adverse outcomes from technology use (Kim et al., 2009). To provide a clearer perspective on the negative aspects associated with gamification use, this study chooses to use the term "perceived sacrifice" in place of "perceived risk." In terms of gamification usage, it primarily revolves around time, effort, privacy, and emotion (Suri and Monroe, 2003; Trang and Weiger, 2021). Prior research has shown that as perceived risk or perceived sacrifice increases, the intention to use technology decreases (Ameen et al., 2021; Cheng et al., 2021; Ha, 2020; Park et al., 2019). Building on this, our hypotheses were:

H1a. **:** Perceived benefit is positively correlated with gamification usage intention.

H1b. **:** Perceived sacrifice is negatively correlated with gamification usage intention.

2.3. Customer relationship management performance

Customer relationship management (CRM) is centered on establishing, maintaining, and strengthening connections between a company and its customers (Josiassen et al., 2014). It involves leveraging technology, processes, and strategies to better understand customer needs, preferences, and behaviors (Chen and Popovich, 2003; Soltani et al., 2018). The primary objective of CRM is to optimize customer interactions and experiences, cultivate customer loyalty, and drive business growth (Cavaliere et al., 2021). According to Reinartz et al. (2004), CRM can be described as three levels: functional, customer, and company levels. In this study, our focus is on assessing an organization's effectiveness in managing customer interactions, relationships, and engagements from a customer behavior perspective.

Chen and Popovich (2003) underscored the greater value of customer retention over customer acquisition and posited that CRM performance revolves around customer profitability, satisfaction, and customer retention. Similarly, Kim and Wang (2019) used satisfaction, loyalty, and customer retention as metrics to assess CRM capabilities. According to Cavaliere et al. (2021), CRM performance indicators are mainly composed of satisfaction, customer acquisition , and customer retention. Besides, Dewnarain et al. (2021) focused mainly on customer engagement and loyalty for the study of CRM performance. Derived from the above literature, we incorporate satisfaction, customer engagement, and customer retention into our research model to examine the CRM performance of microfinance platforms.

Gamification has the potential to instill a sense of achievement and entertainment for customers by incorporating non-gaming elements into the platform. This unique experience, in turn, heightens their intrinsic need for satisfaction. The positive relationship between gamification usage and satisfaction has been consistently demonstrated in prior studies (Silic et al., 2020; Sitthipon et al., 2022; Wei et al., 2023; Xi and Hamari, 2019). Another critical aspect of CRM performance evaluation is tracking and enhancing customer engagement. Existing research suggests that gamification encourages active participation and interaction with a platform, leading to increased customer engagement (Looyestyn et al., 2017; Mohamad and Kassim, 2018; Suh et al., 2018). Additionally, gamification boosts customer retention as users are motivated to continue their engagement and maintain their relationship with a platform (Jain et al., 2020). According to Dexter and Yazdanifard (2015), gamified users are more loyal to a platform as they perceive fun and useful value, which enhances customer retention.

Sustaining user interest and engagement is critical for the success of microfinance platforms. Gamification transforms mundane financial tasks into enjoyable activities, thereby increasing user satisfaction. According to Wu (2023), gamified microfinance platforms can create a more positive user experience and lead to higher levels of customer engagement and retention by integrating elements of fun and entertainment. Additionally, a study by Zhang et al. (2023) involving 447 Alipay users demonstrated that gamified features significantly improved user retention by increasing user satisfaction and engagement. Based on these findings, we proposed the following hypotheses:

H2a. Gamification usage is positively correlated with satisfaction with microfinance platforms.

H2b. Gamification usage is positively correlated with customer engagement with microfinance platforms.

H2c. **:** Gamification usage is positively correlated with customer retention of microfinance platforms.

Prior studies have presented that satisfied customers are more likely to engage actively in a marketing activity (Abror et al., 2020; Thakur, 2018). For example, Ananda et al. (2023) proposed that satisfaction mediates the relationship between service quality and customer engagement with financial services. According to Gustafsson et al. (2005), satisfaction is a crucial determinant of customer retention in retail banking. Banyte and Dovaliene (2014) and Ananda et al. (2023) also showed positive relationships between customer engagement and retention. Therefore, satisfied and engaged customers are more likely to remain loyal and maintain ongoing interactions with the financial service provided by microfinance platforms (Almohaimmeed, 2019; Kim, 2007). Based on this, we hypothesized the following:

H3a. Satisfaction is positively correlated with customer engagement with microfinance platforms.

H3b. Satisfaction is positively correlated with customer retention of microfinance platforms.

H4. **:** Customer engagement is positively correlated with customer retention of microfinance platforms.

3. Methodology

3.1. Measurement

Fig. 2 illustrates our research framework, which is firmly rooted in the theoretical foundation discussed earlier. We adapted established measurement items from prior scholarly works to measure the following constructs: perceived benefit, perceived sacrifice, gamification usage intention, satisfaction, customer engagement, and customer retention. Moreover, to gauge respondents' perceptions, each item related to these constructs was rated on a 7-point Likert scale, ranging from "1 =

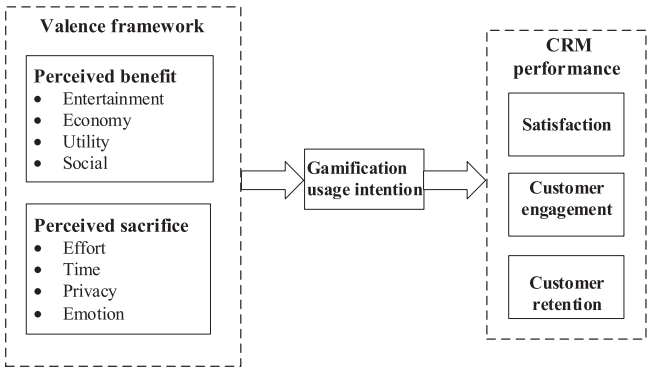

Fig. 2. Research framework.

strongly disagree" to "7 = strongly agree".

3.2. Sampling and data collection

Our sample was sourced from Credamo, a well-established research data platform in China, targeting individuals with extensive knowledge of online microfinance platforms. We refined our questionnaire based on feedback from an initial pre-test to ensure it aligned with our research goals. The survey was randomly distributed to Credamo's diverse and extensive member base. At the beginning of the survey, we included screening questions to confirm participants' familiarity with microfinance platforms. Those without prior experience were directed to exit the survey. To maintain high response quality, we excluded questionnaires that deviated significantly in completion time from the pre-test average or contained inconsistent answers. To further enhance the response rate, we incentivized participants with monetary rewards for submitting valid responses. Notably, our formal questionnaire encompassed 20 questions, each corresponding to distinct constructs (see Table 1). Furthermore, we ensured data quality through attention-check questions and manual screening to eliminate logically contradictory responses. After these procedures, a total of 405 valid samples were obtained.

To ensure an adequate sample size, we performed a statistical power analysis using G*Power 3.1.9.7, following the recommendations of Cohen (1992). The parameters for the analysis included a significance level of 0.05, a statistical power of 80%, and a medium effect size of 0.15. As shown in Fig. 3, a model with five predictors required a minimum sample size of 92 participants. Therefore, the sample size of 405 participants in this study is deemed sufficient for the subsequent statistical analysis.

In terms of our participant demographics (Tables 2), 35.80% were male, and 64.20 % were female. The largest age group was 21-30, making up 51.60 % of the sample, followed by the 31-40 age group at 38.77 %. Significantly, 79.51 % of respondents held bachelor's degrees, indicating a predominantly young and educated cohort. Our sample consists of participants from various regions, with 34.32 % coming from developed areas, 35.06 % from relatively developed areas, and 30.62 %

Table 2
Sample characteristics.

Characteristics	Items	Frequency	Percentage (%)
Gender	Female	260	64.20
	Male	145	35.80
Age (years)	Under 20	18	4.44
	21−30	209	51.60
	31−40	157	38.77
	41−50	14	3.46
	51 or above	7	1.73
Education	High school or below	12	2.96
	Junior college	17	4.20
	Bachelor's degree	322	79.51
	Master's degree or above	54	13.33
Region of origin	Developed	139	34.32
	Relatively developed	142	35.06
	Underdeveloped	124	30.62
Microfinance platforms usage frequency	Daily use	246	60.74
	Weekly use	130	32.10
	Monthly use	21	5.19
	Rarely use	8	1.98

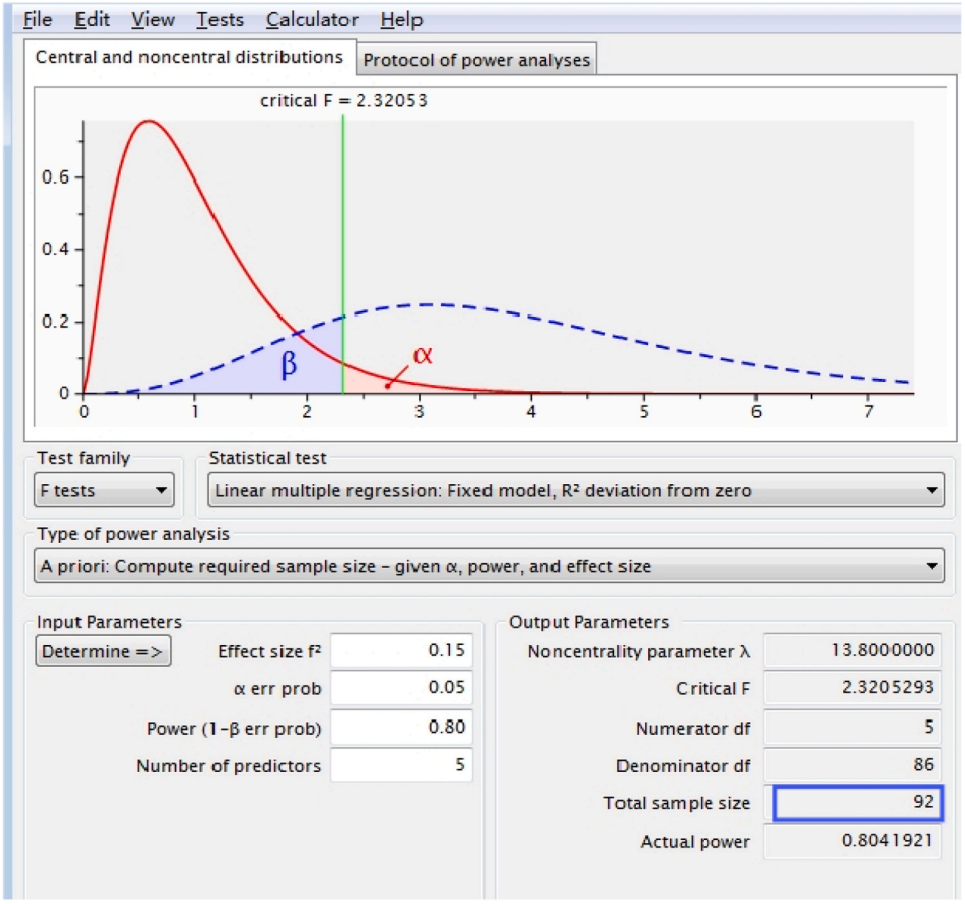

Fig. 3. G*Power analysis.

from underdeveloped areas. Regarding microfinance platform usage frequency, 60.74 % used them daily, while 32.10 % were weekly users.

3.3. Data analysis

In this study, we employed SmartPLS 3.3.9, a widely recognized statistical method, for conducting partial least squares (PLS) analysis. PLS enables the simultaneous evaluation of both measurement and structural models, making it particularly suitable for exploratory analysis (Fornell and Bookstein, 1982) Moreover, PLS is robust to data distribution assumptions (Hair et al., 2011), especially with smaller sample sizes (Chen and Lin, 2015).

Specifically, we proceeded through two distinct steps: an initial evaluation of the measurement model for reliability, convergent validity, and discriminant validity, followed by hypothesis testing to scrutinize the structural model. Additionally, we computed the explained variance (R^2), predictive correlation (Q^2), and goodness-of-fit (GoF) indices to validate the overall robustness of the model.

4. Results

4.1. Measurement model

We assessed the measurement model by conducting tests for reliability, convergent validity, and discriminant validity. As depicted in Table 3, all constructs display Cronbach's alpha values surpassing the 0.6 threshold, signifying an acceptable level of reliability for the measurement model (Morgan et al., 2004). Additionally, the measurement model exhibits robust convergent validity, with all composite reliability (CR) values and factor loadings exceeding the recommended threshold of 0.7 (Nunnally, 1994). Moreover, the average variance extracted (AVE) meets the established criterion of 0.5, as proposed by Fornell and Larcker (1981).

To evaluate discriminant validity, we compared the square root of each construct's Average Variance Extracted (AVE) with its correlation with other constructs, following the method outlined by Hair Jr et al. (2017). The results affirm that the discriminant validity criteria were satisfied, as the square root of AVE for each construct exceeds its correlation with other constructs (Table 4).

Table 3
Reliability and convergent validity.

Construct	Items	Factor loadings	Cronbach's alpha	CR	AVE
Perceived sacrifice	PS1	0.767	0.837	0.890	0.669
	PS2	0.854			
	PS3	0.817			
	PS4	0.832			
Perceived benefit	PB1	0.786	0.729	0.830	0.552
	PB2	0.653			
	PB3	0.725			
	PB4	0.798			
Gamification usage intention	GUI1	0.779	0.638	0.803	0.577
	GUI2	0.772			
	GUI3	0.726			
Satisfaction	S1	0.775	0.635	0.804	0.578
	S2	0.745			
	S3	0.760			
Customer engagement	CE1	0.755	0.644	0.808	0.585
	CE2	0.740			
	CE3	0.798			
Customer retention	CR1	0.831	0.739	0.852	0.657
	CR2	0.840			
	CR3	0.759			

4.2. Structural model

The results of our hypothesis testing reveal that the majority of our hypotheses received support, with the exception of H3b (Fig. 4 and Table 5). As anticipated, gamification usage intention was positively influenced by perceived benefit ($\beta = 0.613$, $p < 0.001$) and negatively affected by perceived sacrifice ($\beta = -0.177$, $p < 0.001$), substantiating the validity of H1a and H1b. Furthermore, gamification usage intention exhibited positive correlations with satisfaction ($\beta = 0.605$, $p < 0.001$), customer engagement ($\beta = 0.451$, $p < 0.001$), and customer retention ($\beta = 0.262$, $p < 0.001$), confirming H2a, H2b, and H2c, respectively. However, while satisfaction displayed a positive relationship with customer engagement ($\beta = 0.390$, $p < 0.001$), the hypothesized relationship with customer retention did not reach statistical significance ($\beta = 0.119$, $p > 0.05$). Consequently, H3a was supported, while H3b was not. Finally, H4 was also upheld, indicating a positive relationship between customer engagement and retention ($\beta = 0.462$, $p < 0.001$).

4.3. Model evaluation

Table 6 provides an assessment of the structural model's adequacy using three key indicators: explained variance (R^2), predictive relevance (Q^2), and goodness of fit (GoF). The R^2 value for customer retention stands at 0.575, indicating that 57.5 % of the variance in customer retention can be attributed to satisfaction and customer engagement. Additionally, gamification usage intention, satisfaction, and customer engagement exhibit R^2 values of 0.535, 0.365, and 0.576, respectively.

To further assess Q^2, we conducted a blindfolding analysis following Henseler et al. (2012). The results reveal positive Q^2 values for gamification usage intention ($Q^2 = 0.299$), satisfaction ($Q^2 = 0.202$), customer engagement ($Q^2 = 0.325$), and customer retention ($Q^2 = 0.367$), signifying substantial predictive relevance for all endogenous constructs. Lastly, we evaluated the model fit based on GoF as follows:

$$\text{GoF} = \sqrt{\overline{AVE} \times \overline{R^2}} = \sqrt{0.563 \times 0.513} = 0.537$$

The GoF in our study was 0.537, well above the recommended threshold of 0.36 for a large GoF (Tenenhaus et al., 2005). These outcomes suggest that our structural model has robust explanatory and predictive capabilities, as well as an excellent overall fit.

Moreover, an instrumental variable technique was adopted to address endogeneity issues, which may result from missing variables, common method bias, or problems with the sources of the data (Hult et al., 2018; Kock, 2015). In line with Kock (2022), we constructed an instrumental variable specifically for customer retention (i_CR). The analysis showed a path coefficient of 0.06 ($p = 0.11$) between i_CR and customer engagement. This statistically insignificant coefficient ($p > 0.05$) demonstrates that endogeneity bias is not present in our model.

5. Discussion

5.1. Key findings

This study delves into the impact of adopting gamification on microfinance platforms in China. It explores the impact of gamification usage on CRM performance while examining the positive and negative elements that affect gamification usage. Our study contributes to existing research by creating a theoretical model that integrates the valence framework with CRM performance indicators. The results demonstrate that the model has excellent explanatory power, predictive power, and model fitness with most of the hypotheses confirmed. Specifically, our key findings include:

Firstly, our results showed that gamification usage intention would be positively influenced by perceived benefit, consistent with existing research (Kanwal et al., 2020; Li et al., 2016; Zhang et al., 2022). The positive influence of perceived benefit suggests that customers are more

Table 4
Discriminant validity.

	Customer engagement	Customer retention	Gamification usage intention	Perceived sacrifice	Perceived benefit	Satisfaction
Customer engagement	***0.765***					
Customer retention	0.723	***0.811***				
Gamification usage intention	0.690	0.653	***0.760***			
Perceived sacrifice	−0.514	−0.460	−0.540	***0.818***		
Perceived benefit	0.715	0.687	0.718	−0.592	***0.743***	
Satisfaction	0.669	0.586	0.605	−0.540	0.621	***0.760***

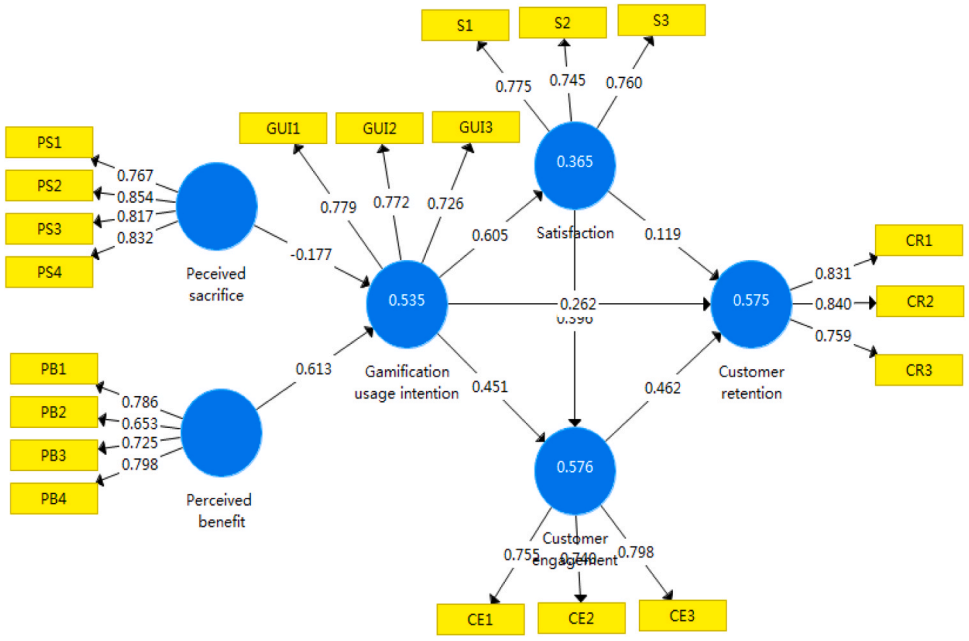

Fig. 4. Results of hypothesis testing.

Table 5
Results of hypothesis testing.

Hypothesis	Path	Standardized path coefficient	t-value	p-value	Conclusion
H1a	PB → GUI	0.613	12.653	0.000	Supported
H1b	PS → GUI	−0.177	3.523	0.000	Supported
H2a	GUI → S	0.605	13.770	0.000	Supported
H2b	GUI → CE	0.451	7.559	0.000	Supported
H2c	GUI → CR	0.262	4.082	0.000	Supported
H3a	S → CE	0.390	6.248	0.000	Supported
H3b	S → CR	0.119	1.909	0.057	No
H4	CE → CR	0.462	7.807	0.000	Supported

Table 6
Model evaluation metrics.

	R^2	Adjusted-R^2	Q^2	GoF
Satisfaction	0.365	0.364	0.202	0.537
Gamification usage intention	0.535	0.533	0.299	
Customer engagement	0.576	0.574	0.325	
Customer retention	0.575	0.571	0.367	

likely to engage with gamification when they perceive tangible advantages. Conversely, a negative correlation was found between perceived sacrifice and gamification usage intention, which supported the evidence from Yu and Huang (2022). This finding indicates that any perceived costs or drawbacks associated with gamification can deter gamification usage intention.

Secondly, we found that gamification usage intention positively affected CRM performance, in agreement with prior research on how gamification usage influences satisfaction (Silic et al., 2020; Wei et al., 2023), customer engagement (Mohamad et al., 2018; Suh et al., 2018), and customer retention (Al-Zyoud, 2021; Dexter and Yazdanifard, 2015). These findings emphasize the role of gamification in fostering positive user experience and promoting customer loyalty.

Thirdly, this study revealed a significant positive correlation between satisfaction and customer engagement, in line with existing research on user behavior (Abror et al., 2020; Thakur, 2018). In the context of microfinance, this finding means that satisfied customers are more likely to be engaged with microfinance services. However, contrary to previous studies (Aityassine, 2022; Danesh et al., 2012; Gustafsson et al., 2005), this study did not find a relationship between satisfaction and customer retention. This outcome suggests that while satisfaction contributes to customer engagement, other factors may play a more substantial role in determining customer retention (Almohaimmeed, 2019).

Finally, customer engagement was found to be positively correlated with customer retention, aligned with prior works by Banyte and Dovaliene (2014) and Ananda et al. (2023). This finding underscores the critical role of engaging customers in long-term relationships with a brand or organization. Thus, customer retention rates might rise as a

result of initiatives to promote customer engagement.

5.2. Implications

This study holds significant theoretical and practical implications. Its primary theoretical contribution lies in that it refines existing theories and enhances our understanding of the complex relationship between gamification usage and the indicators of CRM performance, including satisfaction, customer engagement, and customer retention. Besides, this research offers a comprehensive picture of the positive and negative dimensions influencing gamification adoption by introducing the valence framework. In essence, these findings establish a robust theoretical foundation for future research on user behaviors and their outcomes, particularly within domains such as technology usage, operational management, and finance.

In practical terms, the positive correlation between gamification usage intention and CRM performance underscores the potential advantages of integrating gamification into CRM strategies. Managers of microfinance platforms looking to improve customer satisfaction, engagement, and retention should consider leveraging gamification to enhance user experiences (Hwang and Choi, 2020). To foster gamification usage, managers are encouraged to craft gamification elements that accentuate benefits while minimizing sacrifices. The practical application of this insight involves the design of gamification strategies that effectively communicate user advantages while mitigating perceived drawbacks. Furthermore, for microfinance institutions and technology designers, a dedicated focus on developing games that are more accessible, time-efficient, and entertaining, while maintaining a keen eye on customer privacy, is recommended (Liu et al., 2022).

Furthermore, in the context of microfinance, the insight that satisfaction positively correlates with customer engagement can guide microfinance providers in satisfying users' psychological needs and creating a more engaging user experience (Kim and Kim, 2014). However, the absence of a direct correlation between satisfaction and customer retention suggests the existence of additional factors that influence customer retention in the microfinance industry. This underscores the necessity for further exploration into the multifaceted determinants of customer retention, extending beyond satisfaction. Such research can pave the way for the development of more nuanced and effective strategies to cultivate customer loyalty across diverse industries.

Finally, this research highlights the role of engagement in building long-term relationships with customers and suggests that engagement initiatives can contribute to elevated customer retention rates. Beyond incorporating gaming elements, microfinance providers could further augment customer interaction and engagement by establishing online communities on their platforms (Luo et al., 2019). Additionally, the implementation of prompt and efficient AI-driven customer service also stands as a proactive approach to foster deeper customer integration into microfinance platforms (Krishnan et al., 2022).

5.3. Limitation and future research

Firstly, the generalizability of our findings is limited by our exclusive focus on Chinese microfinance sector customers. To enhance the applicability of the results, future research could broaden the scope by conducting cross-industry analyses to compare outcomes across different sectors. Another limitation is associated with the relatively small sample size used for data collection. While the insights provided are valuable, the restricted sample size may impact the robustness and generalizability of the results. Subsequent research endeavors could benefit from expanding the sample size to address this limitation. Additionally, this study primarily concentrated on the valence framework and CRM performance metrics. To deepen our understanding of the factors influencing CRM performance, future studies should explore potential moderating variables, such as the age, gender, and education of the respondents, as well as their gaming habits. Furthermore, while gamification can enhance user engagement on microfinance platforms, it is essential to consider potential welfare concerns. For example, increased activity driven by gamification might lead to compulsive behavior, where users spend excessive time and resources on the platform. Thus, exploring the pros and cons of promoting gamification strategies from a welfare perspective will be a valuable addition to this research.

In addition to the current focus on customer engagement, future research could examine how gamification influences specific financial behaviors. These include:

a. Examining financial decision-making: Investigate how gamified elements influence specific financial decisions, including borrowing, investing, and saving behaviors on microfinance platforms.
b. Analyzing risk preferences: Study the impact of gamification on users' risk preferences, particularly in the context of choosing different financial products.
c. Intertemporal choices: Explore how gamified interventions affect users' preferences for immediate versus delayed financial gratifications.
d. Financial literacy and education: Assess the role of gamification in enhancing financial literacy and education among microfinance users, potentially leading to more informed financial decisions.

6. Conclusion

This study offers valuable insights into the dynamics of gamification usage within microfinance platforms, specifically focusing on its influence on CRM performance. By integrating the valence framework with CRM performance metrics, we systematically examined both positive and negative dimensions shaping gamification usage and its impact on satisfaction, customer engagement, and retention. To validate our research model, we conducted a PLS-SEM analysis on a sample of 405 microfinance platform users.

Our findings reveal that perceived benefit has a positive influence on usage intention toward gamification of microfinance platforms, while perceived sacrifice exerts a negative influence on it. Furthermore, gamification usage intention shows a positive correlation with CRM performance indicators, including customer satisfaction, engagement, and retention. Notably, our study highlights positive connections between satisfaction and customer engagement, as well as between customer engagement and retention. However, no significant relationship was observed between satisfaction and customer retention.

In conclusion, our study provides valuable insights into the interplay between gamification usage and CRM performance. The results offer practical guidance for managers seeking to improve CRM strategies and enhance user experiences. It underscores the importance of crafting gamification experiences that emphasize benefits while minimizing sacrifices, as well as the positive impact of gamification on user experiences and customer loyalty. Nonetheless, our study also underscores the need for further exploration of the multifaceted factors influencing customer retention beyond satisfaction. These findings serve as a foundation for future research to develop more nuanced strategies for enhancing customer relationships across diverse industries.

Finally, while understanding the relationship between gamification usage and CRM performance, it is crucial to acknowledge the practical challenges involved in implementing gamification strategies. The development and maintenance of gamified features require substantial investment in technology and expertise, which might not be readily available to all platforms. Furthermore, regulatory compliance can impose restrictions that necessitate the inclusion of certain features, even if they are perceived as unfavorable by users. These constraints collectively make it challenging for platforms to fully emphasize benefits while minimizing drawbacks. Despite recognizing the potential benefits of gamification, users may not universally embrace it due to various personal and contextual factors. Individual differences in preferences,

technological proficiency, and risk aversion can significantly influence gamification adoption. Some users might prioritize traditional, straightforward financial interactions over gamified experiences, perceiving them as more reliable or less time-consuming. Additionally, negative past experiences with gamification, concerns about data privacy, or skepticism about the actual value of the rewards can deter users from engaging with gamified features. Contextual factors such as limited access to technology, inconsistent internet connectivity, or a lack of awareness about the gamification benefits can also play a role in hindering widespread adoption. These factors highlight the complex and multifaceted nature of user behavior toward gamification.

Declarations of interest

None.

CRediT authorship contribution statement

Aiping Liu: Conceptualization, Methodology, Formal analysis, Writing - original draft. **Elena Urquía Grande:** Validation, Investigation structure, Writing - review & Editing, Supervision. **Pilar López Sánchez:** Validation, Investigation structure, Writing - review & Editing, Supervision. **Ángel Rodríguez López:** Validation, Investigation structure, Writing - review & Editing, Supervision.

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